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August 6, 2002

Time: 2:25 pm  
(Minneapolis, Minn.)TO: Commissioner for Patents  
Attn: W. David Coleman  
Patent Examining Corps  
Facsimile Center  
Washington, D.C. 20231FROM: Eduardo E. DrakeOUR REF: 303.466US1TELEPHONE: (612) 349-9593FAX NUMBER (703) 872-9319

\* Please deliver to Examiner W. David Coleman in Art Unit 2823. \*

Document(s) Transmitted: A Response Under 1.116 (5 pgs.)Total pages of this transmission, including cover letter: 6 pgs

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In re. Patent Application of: Kie Y. Ahn et al.Examiner: W. David ColemanSerial No.: 09/069,668Group Art Unit: 2823Filed: April 29, 1998Docket No.: 303.466US1Title: BIPOLAR TRANSISTORS WITH LOW-RESISTANCE EMITTER CONTACTS

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By: [Signature]  
Name: Eduardo E. Drake  
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Z. Kohout  
Tina M. Kohout8/6/02  
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#21 / Response  
8/8/02  
✓ Short**EXPEDITED PROCEDURE - EXAMINING GROUP 2823****S/N 09/069,668****PATENT****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Kie Y. Ahn et al.	Examiner:	W. David Coleman
Serial No.:	09/069,668	Group Art Unit:	2823
Filed:	April 29, 1998	Docket:	303.466US1
Title:	<u>BIPOLAR TRANSISTORS WITH LOW-RESISTANCE EMITTER CONTACTS</u>		

**RESPONSE UNDER 37 C.F.R. § 1.116****FAX COPY RECEIVED**

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Commissioner for Patents  
Washington, D.C. 20231

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In response to the Final Office Action mailed May 22, 2002, please enter the following remarks into the record:

**REMARKS**

Claims 1-28 and 32-38 are now pending. Of these, claims 1-28 and 32-38 stand rejected under §112; and claims 1-5, 7-11, 28, and 35-38 stand rejected under §103. The status of claim 34 is not specified in the Final Office Action.

Applicant reserves all applicable rights not asserted in or with this response, including, for example, the right to rebut tacit and explicit characterizations of one or more cited references, and the right to swear behind one or more cited references.

**Response to Action being made Final**

The text of the Action indicates that it has been made final. However, applicant respectfully submits that this finality is premature.

Specifically, MPEP 706.07(a) states that "[u]nder present practice, second or any subsequent actions on the merits shall be final, except where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97(c)."

In contrast to this mandated practice, the present Action includes new rejections that were not necessitated by the previous amendment nor based on new information submitted by the

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applicant. Specifically, the present Action includes new §112 rejections of claims 1-28 and 32-39, when only claims 4, 5, and 34 were amended in the previous amendment.

Moreover, the present Action also includes new §103 rejections, since the previous §103 applied only to claims 1-3, 7-11, 28, and 35-39 and the current Action expands this to claims 4 and 5. (Claims 4 and 5 were previously noted as being allowable if rewritten in independent form.)

In view of these new rejections and the practice mandated by the MPEP, applicant respectfully urges the Examiner to reconsider and withdraw finality.

**Response to §112 Rejections**

The Examiner rejected claims 1-28 and 32-39 under 35 USC § 112, second paragraph, as being indefinite, specifically citing that the term "metal" throughout these claims lacked antecedent basis. With due respect, applicant notes that the term "metal" is not recited as "the metal," and thus does not appear to create an ambiguity in the way that reciting "the metal" without the prior recitation of "a metal" generally would. Indeed, in so far as only "metal" is recited and there is no ambiguity surrounding the term, the claim appears definite, not vague or ambiguous.

Accordingly, applicant respectfully requests that the Examiner reconsider and withdraw this rejection.

**Response to §103 Rejections Based on Tsai and Wolf**

The Examiner rejects claims 1-5, 7-11, 28, 32, 33, and 35-38 under 35 USC § 103(a) as unpatentable over Tsai (U.S. Patent 5,235,204) in view of Wolf ("Silicon Processing for the VLSI Era", vol. 2).

In response, applicant asserts respectfully that the rejection fails to make a prima facie case of obviousness and should be withdrawn for one or more of the following reasons.

First, the rejection is also based on an inaccurate reading of Wolf. Specifically, the Examiner proposes that "[i]t would have been obvious to form the metal emitter contact of Tsai by cross diffusing metal and a portion of the polysilicon structure, because [Wolf teaches that]

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this process alleviates the problem of junction spiking." However, a careful reading of Wolf reveals that it does not teach that cross-diffusion itself alleviates junction spiking.

According to Wolf, junction spiking results normally from the transport (diffusion or migration) of silicon into aluminum. Wolf explains that it alleviates junction spiking by using a sacrificial layer to donate silicon to the aluminum contact, rather than allowing the underlying silicon substrate to donate silicon. Use of the sacrificial donation prevents void formation in the substrate and this in turn prevents junction spiking. Thus, according to the terms of Wolf, it is not the act of silicon transport that prevents the junction spiking, but rather the use of a sacrificial layer in a position to prevent silicon transport from the substrate that actually prevents junction spiking. (See Wolf page 126, section 3.5.2.2.) Indeed, if one were to remove the sacrificial layer, silicon transport would not only still occur at high current levels, but also still cause junction spiking. Thus, one of ordinary skill would not read Wolf as teaching that "silicon transport prevents junction spiking. As such, the asserted motivation is founded on a misreading of Wolf.

**Second**, Wolf teaches away from the rejected claims. MPEP 2141.02 dictates that "a [cited] reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention." In the present case, Wolf recognizes that silicon transport from its substrate is undesirable and prevents such transport using its sacrificial layer. In addition, Wolf states, at page 126, line 1, that "[i]nterdiffusion is the dominant process that destroys these contact structures." Thus, absent hindsight, it appears fair to conclude that one of ordinary skill confronted with the full contents of Tsai and Wolf would not be led or moved to construct emitter contacts through use of "cross diffusion" as prescribed in the pending claims.

**Third**, the rejection is premised on an interpretation of "cross-diffusion" that is not supported in the record. Specifically, the Examiner asserts without evidentiary support that "[i]t is well known in the art that when one distinct material is transported into another material is cross diffusion." Respectfully, applicant regards this bald assertion as the Examiner taking Official Notice of a meaning of "cross diffusion." Accordingly, applicant respectfully renews its request, in accord with MPEP 2143, that the Examiner provide an affidavit or other credible documentation that the art defines "cross diffusion" as occurring when only one material is

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transported into another material rather than as a two-process where two materials are transported in opposing directions. In the alternative to submission of credible evidentiary support, the assertion and all rejections that rely on it should be withdrawn.

Fourth, the rejection is premised on impermissible degree of hindsight. The Action proposes that one would combine the teachings of Wolf with those of Tsai to prevent junction spiking. Yet, there is zero evidence that one of ordinary skill would have recognized that Tsai suffers from junction spiking. Indeed, the Action cites nothing to support this point, suggesting that the Examiner is tacitly taking Official Notice that Tsai suffers from junction spiking. As such, applicant respectfully requests, pursuant to MPEP 2143, that the Examiner provide an affidavit or other credible documentation that the one of skill in the art would comprehend Tsai as having a problem with junction spiking.

For the above cited reasons, applicant respectfully requests that the Examiner reconsider and withdraw the §103 rejections based on Tsai and Wolf.

**Response to §103 Rejections Based on Tsai, Wolf, and Aboelfotoh**

The Examiner rejected dependent claim 6 as unpatentable over Tsai in view of Wolf, and further in view of Aboelfotoh (U.S. Patent 5,801,444). In response, applicant submits that this proposed three-part combination of Tsai, Wolf, and Aboelfotoh inherits the deficiencies of the proposed Tsai-Wolf combination. Accordingly, the rejection of claim 6 similarly fails to establish a prima facie case for obviousness and should also be withdrawn.

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**Conclusion**

In view of the foregoing remarks, applicant respectfully requests reconsideration and withdrawal of all rejections. Alternatively and in view of the newly presented rejections, applicant respectfully requests that the Examiner withdraw finality and submit evidence regarding his interpretation of cross-diffusion and the existence of a junction spiking problem in Tsai. Additionally, applicant invites the Examiner to call its patent counsel Eduardo Drake at 612-349-9593 to discuss what steps might be taken to secure allowance if the application is not deemed allowable in its present condition.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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KIE Y. AHN ET AL.

AUG 6 2002

By their Representatives,

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Date 6 August 2002By 

Eduardo E. Drake

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